HP ConvergedSystem 300 for Vertica Getting Started Guide

Abstract

This document provides an overview of the HP ConvergedSystem 300 for Vertica appliance. It is intended to be used by system administrators and technical professionals involved with planning, operations, and administration of the appliance or database.

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1 Overview

The HP ConvergedSystem 300 for Vertica is a purpose-built solution developed through collaborative engineering efforts between the HP ConvergedSystems Engineering Team and HP Vertica. Designed to simplify the implementation and management of real time analytic applications, HP CS300 Vertica provides excellent performance through Massively Parallel Processing (MPP) technology.

The HP CS300 Vertica architecture enables distributed query execution, where each query executes on all HP Vertica clusters in parallel. This architecture gives the HP CS300 Vertica application system the speed to provide user queries with significantly higher levels of I/O throughput than is available on a scale-up symmetric multiprocessing (SMP) system.

Table 1 Related documentation

Topic	Location
HP ProLiant Gen8 Server	HP ProLiant DL380p Gen8 Server User Guide HP ProLiant DL360p Gen8 Server User Guide
HP Insight Cluster Management Utility	http://h20628.www2.hp.com/km-ext/kmcsdirect/emr_na-c04015665-2.pdf
HP Insight Management	http://www.hp.com/go/insightmanagement/docs
HP iLO	http://www.hp.com/go/ilo/docs
HP Insight Remote Support	http://www.hp.com/go/insightremotesupport/docs
HP Vertica documentation	http://www.hp.com/go/convergedsystem/cs300vertica/docs
HP Vertica Webinars	Management Console Demo Semi structured data

Who should use this guide

This document is intended for system administrators and database administrators. Knowledge of Linux and SQL commands is required.

2 The HP CS300 Vertica appliance

This section provides information about your servers and will help you to locate components in your HP CS300 Vertica appliance.

The appliance arrives at your location in a default configuration with pre-loaded software as shown in Table 2: "Appliance configuration".

Table 2 Appliance configuration

	Configuration
HP Vertica server	• HP ProLiant DL380p Gen8 server • 2U Rack form factor • Two Intel Xeon E5–2690v2 (CPU) • Ethernet 10Gb 2P 561FLR-T FIO adapter • Two 300GB 6G SAS 10K 2.5in SC ENT HDD • Twenty-three 600GB 6G SAS 10K 2.5in SC ENT HDD • Two 750W CS Plat PL hot plug power supply kit • 128 GB (eight 16GB 2Rx4 PC3–14900R-13 kit) HP Insight Cluster Management Utility – 3 year 24x7 Flex license
2 Management servers	• HP ProLiant DL360p Gen8 server • 1U Rack form factor • One Intel Xeon E5–2660 v2 (CPU) • 64 GB (four 16GB 2Rx4 PC3–14900R-13 kit) memory • Four 600 GB 6G SAS 10K 2.5in SC ENT HDD • Ethernet 10 Gb 2P 51FLR-T FIO adapter • Two 460W CS Plat PL hot plug power supply kit HP Insight Control HP Vertica Analytics Platform HP Insight Control Flex license RHEL Server 2 Skt 1 Guest 24x7 3 year license HP Insight Cluster Management Utility – 3 year 24x7 Flex license HP Insight Remote Support Advanced Operating System — Red Hat Enterprise Linux 6.4 Operating System — Windows server 2012
Networking	HP 5900AF-48XGT 4QSFP+ switch • Forty-eight RJ-45 1/10GbE ports • Four QSFP+ 40–GbE ports • One RJ-45 serial console port • One RJ-45 out-of-band management port • One USB 2.0
Support	3 year — 4 hour 24x7 Proactive Care

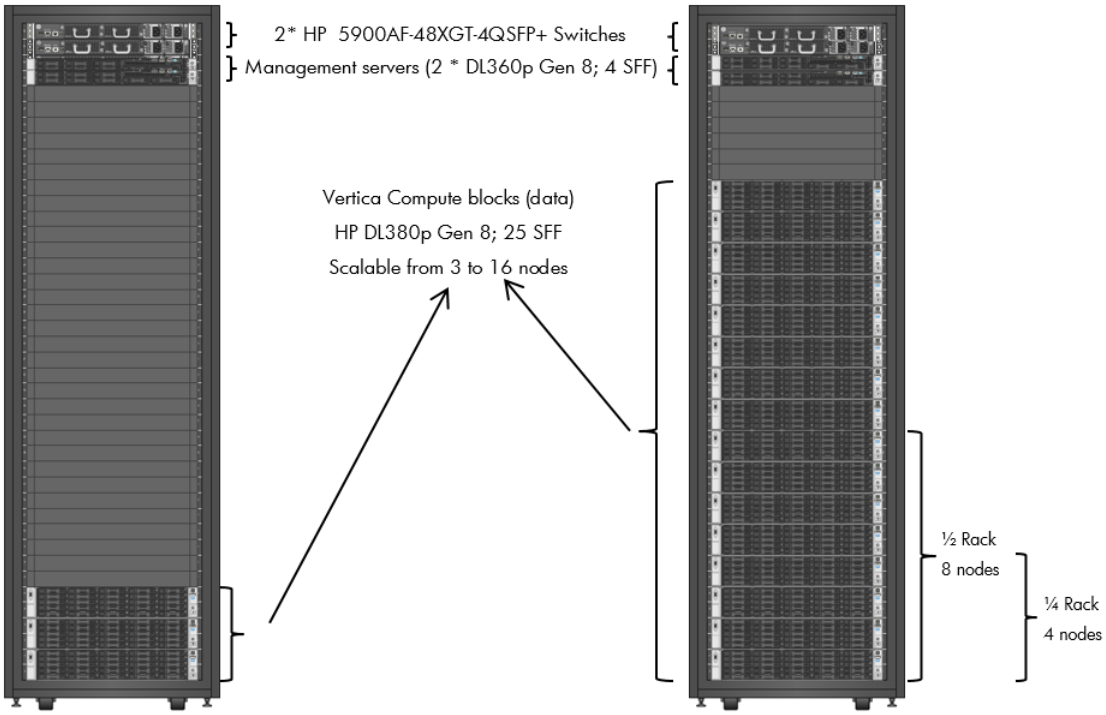
TIP: Serial numbers are listed on the Linux management server in the `/opt/hp/CS300/CS300SN.log` file and on each physical device.

Appliance overview

The appliance is scalable from 3 to 16 servers per rack as shown in "Hardware configuration" (page 6). There are two management servers running Red Hat Enterprise Linux (RHEL) and Microsoft Windows Server, respectively. The Linux server supports HP Vertica and cluster management. The Windows server manages HP Insight Control and HP Insight Remote Support Advanced.

TIP: HP recommends configuring in multiples of 4 per rack.

Figure 1 Hardware configuration


2* HP 5900AF-48XGT-4QSFP+ Switches
Management servers (2 * DL360p Gen 8; 4 SFF)
Vertica Compute blocks (data)
HP DL380p Gen 8; 25 SFF
Scalable from 3 to 16 nodes
½ Rack
8 nodes
¼ Rack
4 nodes

The appliance uses a simple naming convention to distinguish servers. Each server is represented using the rack number, server type, and server number as shown below.

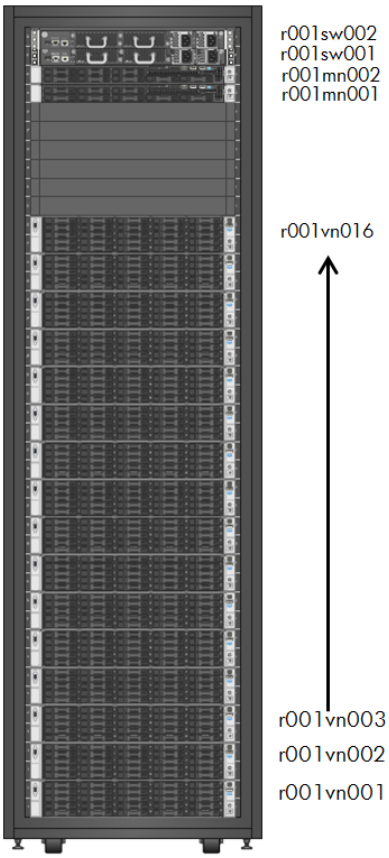
- rxxx — rack number
- dd — indicates type
  - vn — Vertica server
  - mn — Management server
  - sw — Ethernet switch
  - pd — Power distribution unit
- yyy — number in the rack

The example in Figure 2: "Appliance naming convention" (page 7) shows the management servers using the naming conventions.

r001mn002 — Windows management server

r001mn001 — Linux management server

Figure 2 Appliance naming convention



Installation

During the HP CS300 Vertica Installation & Startup Service, your appliance was connected using either 10Gb or 1Gb Ethernet and configured for your corporate network. Your organization supplied passwords and IP addresses to HP Technical Services. For a high-level overview of your configuration, including IP addresses, see the file at `/opt/hp/CS300/HPCS300.xml` on the Linux management server (r001mn001), as shown in "IP addresses" (page 8).

IMPORTANT: Do not edit or change the `/opt/hp/CS300/HPCS300.xml` file.

Figure 3 IP addresses

```
<?xml version="1.0" encoding="UTF-8" ?>
- <Appliance>
    <Version Hardware="1.0" Software="1.0" ApplianceLevel="1.0" Model="HP ConvergedSystem 300 for Vertica" />
    <Network Public="255.255.255.0" Private="255.255.255.0" Gateway="172.24.8.254" DNS="172.24.8.254" NTP="172.24.8.254" Timezone="US/Central" CEN_Vlan="112" />
  - <Nodes>
      <Node Name="r001mn001" RackId="1" Location="U39" Model="DL360p Gen8" Function="Management" PublicIP="172.24.8.201" iLOIP="172.24.8.211" />
      <Node Name="r001mn002" RackId="1" Location="U40" Model="DL360p Gen8" Function="Management" PublicIP="172.24.8.202" />
      <Node Name="r001vn001" RackId="1" Location="U1" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.1" />
      <Node Name="r001vn002" RackId="1" Location="U3" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.2" />
      <Node Name="r001vn003" RackId="1" Location="U5" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.3" />
      <Node Name="r001vn004" RackId="1" Location="U7" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.4" />
      <Node Name="r001vn005" RackId="1" Location="U9" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.5" />
      <Node Name="r001vn006" RackId="1" Location="U11" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.6" />
      <Node Name="r001vn007" RackId="1" Location="U13" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.7" />
      <Node Name="r001vn008" RackId="1" Location="U15" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.8" />
      <Node Name="r001vn009" RackId="1" Location="U17" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.9" />
      <Node Name="r001vn010" RackId="1" Location="U19" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.10" />
      <Node Name="r001vn011" RackId="1" Location="U21" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.11" />
      <Node Name="r001vn012" RackId="1" Location="U23" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.12" />
      <Node Name="r001vn013" RackId="1" Location="U25" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.13" />
      <Node Name="r001vn014" RackId="1" Location="U27" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.14" />
      <Node Name="r001vn015" RackId="1" Location="U29" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.15" />
      <Node Name="r001vn016" RackId="1" Location="U31" Model="DL380p Gen8" Function="Vertica node" PublicIP="172.24.8.16" />
    </Nodes>
  - <Licenses>
      <License Name="Insight Control" Location="/opt/hp/CS300/licenses/InsightControl.lic" />
      <License Name="Insight CMU" Location="/opt/hp/CS300/licenses/cmu.lic" />
      <License Name="Vertica Enterprise" Location="/opt/hp/CS300/licenses/VerticaEE_HP_1TB.dat" />
    </Licenses>
</Appliance>
```

NOTE: There are two HP 40GbE QSFP+ ports per switch. Each 40 GbE QSFP+ port is convertible to 10GbE SFP+ with an adapter. Two adapters are provided with each rack.

In addition, there are thirty 1GbE/10GbE RJ45 ports per switch.

There are two Ethernet switches, each switch with fourteen available ports, for a total of fifty-six available 10Gb/1Gb ports on both switches. There are also two 40Gb ports on each switch.

TIP: HP recommends assigning Ethernet ports beginning at port 44 and working backward, ending at port 17.

Available ports are shown in "Ethernet ports" (page 8).

Figure 4 Ethernet ports

Color key

40 GbE Uplink
Vertica
Customer
IRF

Ethernet Switch R001SW002

Ethernet ports

1	3-16	17-42	43	45	47	49	51
R001VN001 Port2	R001VN003 Port2	Customer	Customer	R001MN001 Port2		Customer	R001SW001 P51
2	3-16	17-42	44	46	48	50	52
R001VN002 Port2	R001VN004 Port2	Customer	Customer	R001MN002 Port2	R001PD002	Customer	R001SW001 P52

Ethernet Switch R001SW001

Ethernet ports

1	3-16	17-42	43	45	47	49	51
R001VN001 Port1	R001VN003 Port1	Customer	Customer	R001MN001 Port1	R001MN001 iLO	Customer	R001SW002 P51
2	3-16	17-42	44	46	48	50	52
R001VN002 Port1	R001VN004 Port1	Customer	Customer	R001MN002 Port1	R001PD001	Customer	R001SW002 P52

Management software

Your installation includes HP Insight Control management tools. Insight Control delivers a set of software and tools that combine with Systems Insight Manager to provide a powerful mechanism for discovering, installing, monitoring, and managing HP ProLiant servers. Insight Control enhances the system monitoring, management, and deployment features of Systems Insight Manager. You can access both tools from the HP CS300 Vertica home page.

The HP CS300 Vertica home page appears after you connect to the Linux Management Server (r001mn001) from your browser. The home page provides an interface for navigating the various browser-based server utilities:

- **Database Management**
- **CS300 Monitoring**
- **CS300 Management**
- **Documentation**
- **Resources**

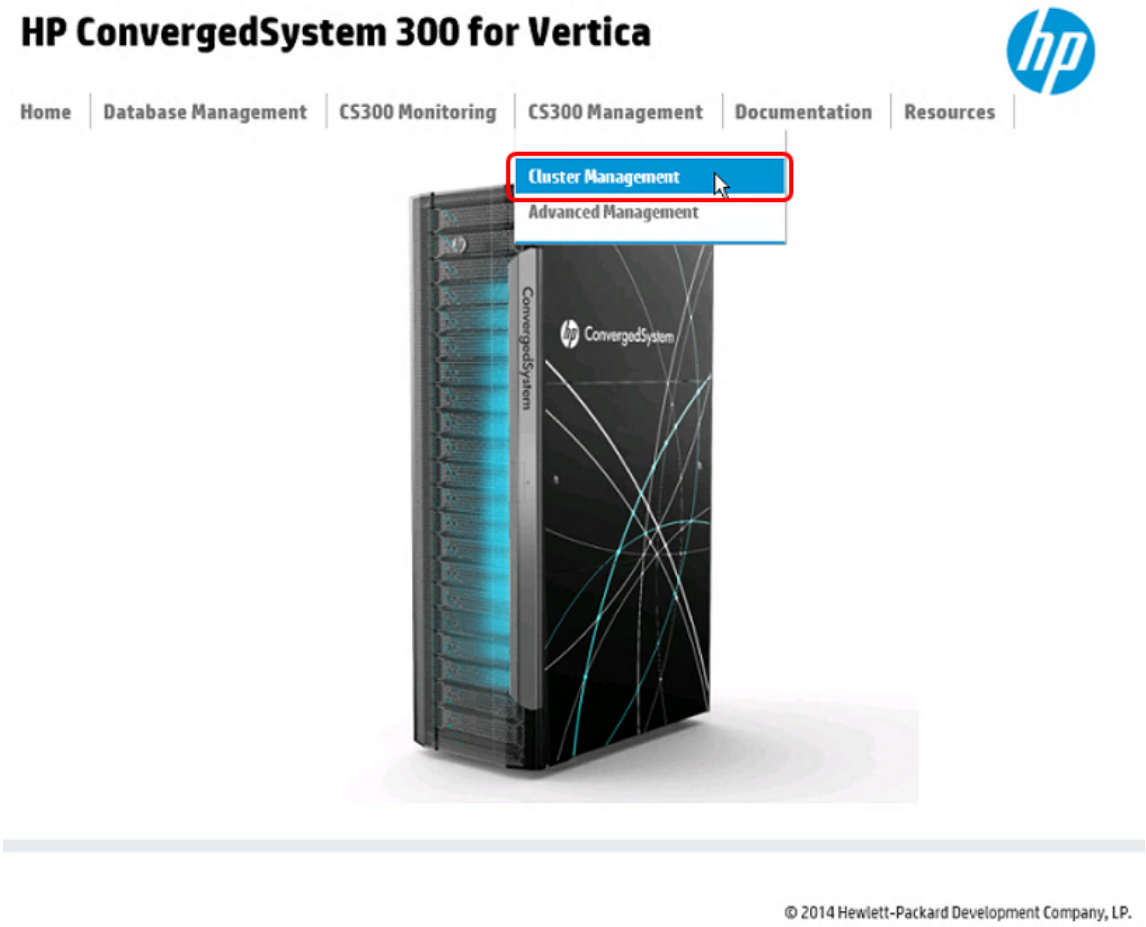
Figure 5 HP CS300 Vertica home page

HP Insight Cluster Management Utility

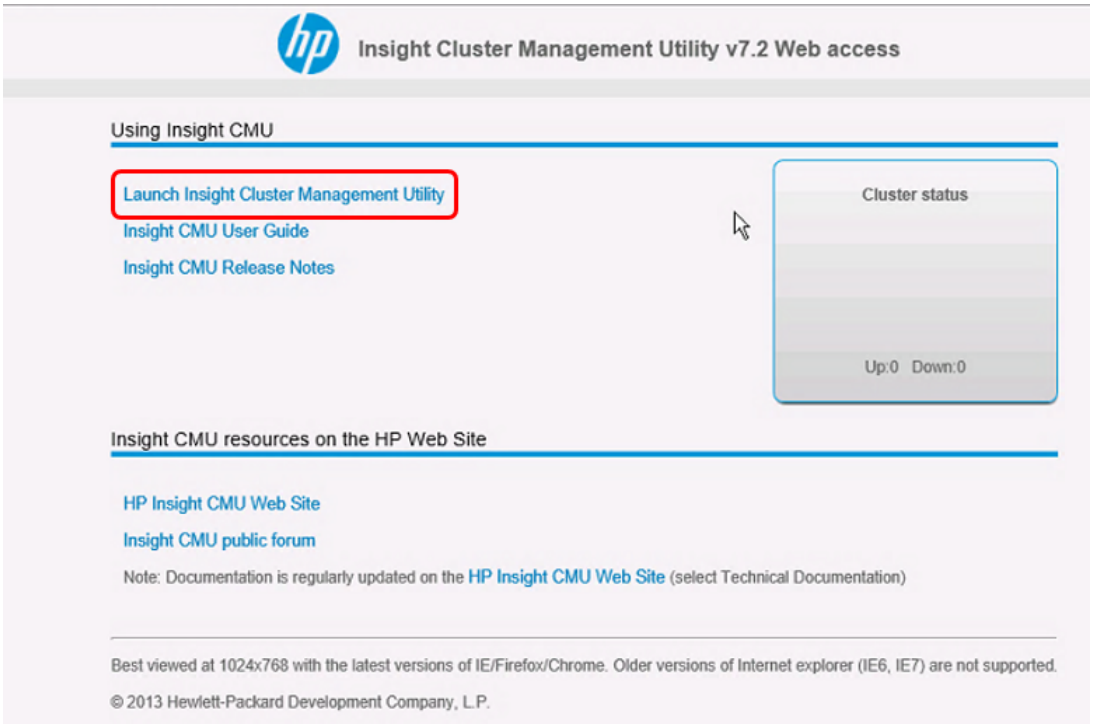
HP Insight Cluster Management Utility (HP Insight CMU) is a collection of tools for managing and monitoring large clusters. Access HP Insight CMU from the HP CS300 Vertica home page using the following procedure:

Launching HP Insight CMU

1. Open your browser and connect to the IP address of the Linux Management Server (r001mn001). For example, `http://000.000.000.000`.
2. The HP CS300 Vertica home page appears. Click **CS300 Management** on the menu bar and select **Cluster Management**.



3. The HP Insight CMU page appears:


Insight Cluster Management Utility v7.2 Web access
Using Insight CMU
Launch Insight Cluster Management Utility
Insight CMU User Guide
Insight CMU Release Notes
Cluster status
Up:0 Down:0
Insight CMU resources on the HP Web Site
HP Insight CMU Web Site
Insight CMU public forum
Note: Documentation is regularly updated on the HP Insight CMU Web Site (select Technical Documentation)
Best viewed at 1024x768 with the latest versions of IE/Firefox/Chrome. Older versions of Internet explorer (IE6, IE7) are not supported.
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4. Under **Using Insight CMU**, click **Launch Insight Cluster Management Utility**.

See the HP Insight Cluster Management Utility User Guide for more information.

To monitor servers from a single window, HP Insight CMU provides a default set of sensors for tasks such as CPU load, memory usage, I/O performance, and network performance. You can use the sensor Information to ensure optimal server performance and to troubleshoot potential problems.

HP Insight Remote Support

HP Insight Remote Support Advanced is a software tool that is installed based on your HP Support Contract. This utility continuously monitors your servers, storage, network, and other devices, alerting you to potential problems. It sends information to HP call center staff or your administration staff, depending on your configuration and level of support. Using HP Insight Remote Support can assess issues remotely to determine if a problem can be resolved remotely, without a site visit. For detailed information see the HP Insight Remote Support documentation.

3 Using HP Vertica

Overview

The HP Vertica Analytics Platform (HP Vertica) is pre-installed on the HP ConvergedSystem 300 for Vertica (HP CS300 Vertica). This section describes how to create and run an HP Vertica database and run queries.

View the full HP Vertica documentation set on the HP Enterprise Information Library at:

www.hp.com/go/convergedsystem/cs300vertica/docs

Learning about HP Vertica

For an overview of how to design, build, operate, and maintain an HP Vertica database, HP recommends that you read the *HP Vertica Concepts Guide*.

Accessing HP Vertica

Before you create a database, this section:

- Introduces the HP Vertica `superuser`.
- Describes HP Vertica interfaces.
- Describes how to connect and log in to HP Vertica.

Database superuser (`dbadmin`)

When HP Vertica was installed on HP ConvergedSystem 300 for Vertica, an administrative account, `dbadmin`, was created and configured using a password your organization supplied.

The `dbadmin` account is a non-root system user who is also the HP Vertica `superuser`. The `dbadmin` account can perform all database-related tasks and others, such as upgrading license keys and installing client drivers.

Other HP Vertica Users

Before additional users can log in to HP Vertica, the `dbadmin` user must first create a database. The `dbadmin` user can then create database users, including other database administrator (DBA) accounts. Database- and user-creation topics are described in later sections.

HP Vertica interfaces

Use one or any combination of the following interfaces to access HP Vertica:

Table 3 Interfaces

Interface	Description
HP CS300 Vertica Home Page	Use the HP CS300 Vertica home page to navigate browser-based management tools. This page appears when you connect to the r001mn001 Linux management server from a browser session.
Linux command line	A standard shell interface that sends keyboard commands to the operating system.
vsql client interface	A native, command-line utility that interacts directly with the HP Vertica database. From vsql, run supported statements, functions, and other operations. See Using vsql in the *HP Vertica Programmer's Guide*.
HP Vertica Administration Tools	A basic user interface for the database superuser (dbadmin) to perform operational and management tasks. Only the

Table 3 Interfaces *(continued)*

Interface	Description
	`dbadmin` user can run the Administration Tools. See Using the Administration Tools in the *HP Vertica Programmer's Guide*. Use the vsql client interface, or another client of your choice, to run database queries and analytic functions.
HP Vertica Management Console (MC)	A graphical, browser-based interface to monitor and manage one or more HP Vertica clusters and perform other database related tasks. See Management Console in the *HP Vertica Concepts Guide*.
Client Drivers	Industry standard drivers such as, ODBC, JDBC and ADO.NET, let you connect your applications to HP Vertica. After you connect, your application can load and exchange data, generate reports, and complete other database tasks. You also use client drivers to connect with third-party applications, such as Cognos and MicroStrategy. See the HP Vertica Client Libraries in the *HP Vertica Programmer's Guide*.

Connecting to HP Vertica

TIP: For IP address details, see the file named `/opt/hp/CS300/HPCS300.xml` on the Linux management server (r001mn001) as the example shown in "IP addresses" (page 8).

Connecting to HP Vertica using a remote terminal client

To log in to the HP Vertica server as the database user (dbadmin), use an SSH, remote-terminal client, such as PuTTY or a Cygwin bash shell.

1. Launch the PuTTY application.
2. In the Host Name or IP dialog box, type the name of the host or IP address of the server to which you want to connect.
3. Under **Connection type**, verify that SSH is selected and click **Open**.
4. At the PuTTY `log in as` prompt, type **`dbadmin`** and then enter the dbadmin password.

For more information see the Notes for Remote Terminal Users in the *HP Vertica Administrator's Guide*.

Connecting to HP Vertica using CLI-based Administration Tools

The HP Vertica CLI-based Administration Tools provide functionality that is not available in the browser-based HP Vertica Management Console. To run CLI-based Administration Tools, you must connect to a node that is running HP Vertica.

After you've logged in to HP Vertica as the dbadmin user, run the Administration Tools. The Administration Tools connect to the database and transfer control to vsql.

For a comparison between Administration Tools and Management Console functionality, see Administration Tools and Management Console in the *HP Vertica Administrator's Guide*.

You can run vsql from the command line to connect to a database from any Linux host, including hosts that are not part of the HP Vertica database cluster.

For more information, see the following topics in the *HP Vertica Programmer's Guide*:

- Connecting from the Administration Tools
- Connecting from the Command Line
- Connecting from a Non-Cluster Host

NOTE: Non-dbadmin users cannot log in to the vsql client until the dbadmin user creates a database user account for them.

1. Log on to an HP Vertica node using an SSH remote terminal client. See the section "Connecting to HP Vertica using a remote terminal client" (page 13) to connect using PuTTY.
2. At the command line, log in as the dbadmin user and then type `admintools` .
3. If the **License EULA Acceptance** screen appears, click the box beside **accept**.
4. Choose a task from the Administration Tools menu options.

NOTE: The EULA (End User License Agreement) appears the first time you run Administration Tools as the dbadmin user or after you upgrade your license.

The default location of your Enterprise Edition license key is: `/opt/hp/CS300/licenses/cust_vlicense_xxx_bytes.dat`, where `cust_vlicense_xxx_bytes.dat` is named specifically for your environment.

When prompted, type the location for your Enterprise Edition license key and click **OK**.

See Connecting From the Administration Tools in the *HP Vertica Programmer's Guide* for detailed information.

Connecting to HP Vertica using the browser-based Management Console

You can use the HP CS300 Vertica home page to connect to the HP Vertica Management Console using a browser connection.

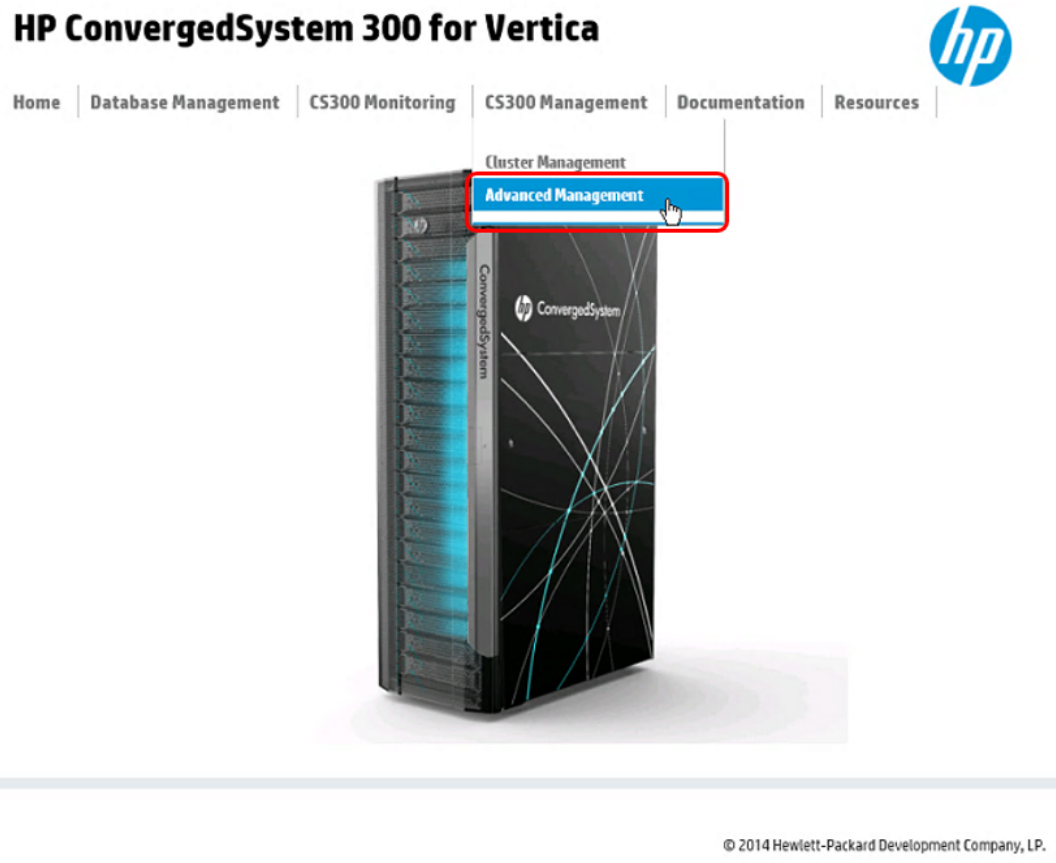
1. Open your browser and connect to the IP address of the r00mn001 server. For example, `http://000.000.000.000`.
2. If the browser displays a **Certificate Error** choose the option that says **Continue to this website (not recommended)** to bypass this page.
3. The HP CS300 Vertica home page appears. Click **Database Management**, and click **HP Vertica Management** to launch Management Console.

4. The first time you launch Management Console you must accept the Enterprise Edition license agreement. After reading the agreement, click the box next to **I accept the above terms and conditions** and click **Next**.
5. The Management Console home page appears.

See Using Management Console in the *HP Vertica Administrator's Guide*.

NOTE: You can use the HP CS300 Vertica home page to link to other management tools to perform various device-management tasks. On the HP CS300 Vertica home page, select **CS300 Management** from the menu bar and click **Advanced Management** to access:

- HP Vertica Management Console
- HP Insight Cluster Management Utility
- HP Insight Control
- HP Insight Remote Support



Connecting to HP Vertica using supported client drivers

HP Vertica provides industry-standard client drivers (ODBC, JDBC, ADO.NET) for connecting your applications to HP Vertica. Use HP Vertica client drivers to connect with third-party applications, such as Cognos or MicroStrategy. For more information, see HP Vertica Client Libraries in the *HP Vertica Programmer's Guide*.

Running the HP Vertica Getting Started Tutorial

To help orient new users, the *HP Vertica Getting Started Guide* includes a short tutorial. This section provides tips on getting started with your first database. No special knowledge is required to create the database, although a basic knowledge of SQL commands is useful for running queries.

Creating the example database

After you connect to HP Vertica, use the tutorial to learn how to create a database and run simple queries following these short procedures:

- Set up the example environment

- Create an example database named VMart
- Connect to the database
- Define the database schema
- Load sample data

IMPORTANT: To get started, see Advanced Installation in the *HP Vertica Getting Started Guide*.

Querying tables in the example database

The VMart database includes sample scripts. These scripts contain SQL statements that represent business queries. For example, the following sample query returns the values for five products in the Dairy department with the lowest fat content:

```
VMart => SELECT fat_content
    FROM ( SELECT DISTINCT fat_content
       FROM product_dimension
       WHERE department_description
       IN ('Dairy') ) AS food
    ORDER BY fat_content
    LIMIT 5;
```

For more examples, see Sample Scripts in the *HP Vertica Getting Started Guide*. After you become familiar with the VMart schema, you can create your own queries. See the Appendix in the *HP Vertica Getting Started Guide* for more information about the VMart schema.

Using Database Designer to optimize a design

An HP Vertica database stores its data in a physical format called projections. For best performance, optimize projections based on their data and workload characteristics.

For details, see Using Database Designer to Create a Comprehensive Design in the *HP Vertica Getting Started Guide*.

HP Vertica provides three ways for you to optimize projections:

- HP Vertica Management Console
- Administration Tools
- Programmatically

Generally, you load queries on your development system that are representative of your user's workload and data. Then, run Database Designer using the Administration Tools. See "Learning about Database Designer and projections" (page 17) for more resources.

Table 4 Learning about Database Designer and projections

If you want to:	Read:
Understand how to create projections	Physical Schema in the *HP Vertica Concepts Guide*
Learn about the Database Designer	Database Designer in the *HP Vertica Concepts Guide*
Understand and choose from different methods to create database designs	How to create a design in the *HP Vertica Administrator's Guide*

Dropping the example database

When you have finished exploring the VMart database, you can drop it to restore your hosts to their original state. See Restoring the status of your host in the *HP Vertica Getting Started Guide*.

Performing common database administrator tasks

This section describes some of the common tasks the HP Vertica database administrator performs. This section assumes that you are familiar with the basic concepts and terminology of relational database management systems and SQL. For more information, see the *HP Vertica Administrator's Guide*.

Creating a database

HP Vertica provides two options to create a database: Management Console or the Administration Tools. See Create an Empty Database in the *HP Vertica Administrator's Guide*.

Rules for database and password names

When you create a database, one of your first tasks is to name the database and supply a secure password. See Creating a Database Name and Password in the *HP Vertica Administrator's Guide*.

Starting and stopping the database

You can start and stop your database using the Administration Tools, Management Console or from the command line. For details, see the following topics in the *HP Vertica Administrator's Guide*:

- Starting the Database
- Stopping the Database

Reconnecting to the database

- If you close your terminal window while the database is running, you can reconnect as follows:
  1. Open a remote session to reconnect to HP Vertica, see "Connecting to HP Vertica using a remote terminal client" (page 13).
  2. Log in as the dbadmin user.
  3. Type `admintools` at the command line.
  4. Select `Connect to Database` from the Main Menu and click `OK`.
- If you close your browser window while the database is running, follow the steps in "Connecting to HP Vertica using the browser-based Management Console" (page 14)

See Using the Administration Tools in the *HP Vertica Administrator's Guide*.

Implementing security

In HP Vertica, there are three primary security concerns:

- Client authentication prevents unauthorized access to the database.
- Client authorization controls what users can access and change in the database.
- Connection encryption prevents the interception of data and authenticates the identity of the server and the client.

See Implementing Security in the *HP Vertica Administrator's Guide*.

Creating new database users

Client authentication controls which database objects users can access and change in the database. To prevent unauthorized access, a superuser limits access by assigning privileges directly to users or to roles through a series of `GRANT` statements.

A Management Console administrator can also grant MC users access to one or more HP Vertica databases through the MC interface.

See Managing Users and Privileges in the *HP Vertica Administrator's Guide*.

Creating tables

You can create two types of tables in HP Vertica, columnar and flexible.

- Columnar— Columnar tables store data the way it is typically queried for performance, based on a pre-defined data model. Column storage is ideal for read-intensive workloads because it can reduce disk I/O.
- Flexible — Flexible tables store data in a way that is designed especially for loading and querying unstructured and semi-structured data, such as social media files (as JSON) and ArcSight log files.

Additionally, you can create either type of table as either persistent or temporary. You can also create views to capture a specific set of table columns that you query frequently.

For details, see Working with Tables in the *HP Vertica Administrator's Guide* and the *HP Vertica Flex Tables Guide*.

Loading data into the database

If you followed the tutorial in the *HP Vertica Getting Started Guide*, you already loaded data into the VMart example database. After you create a working database, you can load data in several ways, depending on the frequency of new data and other requirements. To learn more, see the following topics in the *HP Vertica Administrator's Guide*:

- Bulk Loading Data
- Trickle Loading Data

Monitoring the database

HP Vertica provides tools that let you monitor many operational aspects of your database, and its overall health and performance. For details about how and what to monitor, see the following topics the *HP Vertica Administrator's Guide*:

- Monitoring HP Vertica
- Using System Tables

Using HP Vertica Management Console

The Management Console (MC) interface lets you monitor and manage one or more database clusters. You can create a new database cluster or import an existing cluster, optimize a database design, and perform other administrative tasks on the cluster.

To learn more about Management Console, see "HP Vertica Management Console tasks" (page 19):

Table 5 HP Vertica Management Console tasks

If you want to:	Read:
Understand Management Console components and its underlying architecture and security.	Management Console in the *HP Vertica Concepts Guide*
Understand the difference between the browser-based Management Console versus the CLI-based Administration Tools functionality.	Administration Tools and Management Console in the *HP Vertica Administrator's Guide*
Connect to MC, manage client connections and database clusters, manage MC settings, or change MC application and agent ports.	Using Management Console in the *HP Vertica Administrator's Guide*
Use MC to monitor your database cluster, query, session, and node activity, or view MC-managed database messages and MC user activity.	Monitoring HP Vertica Using MC in the *HP Vertica Administrator's Guide*

Table 5 HP Vertica Management Console tasks *(continued)*

If you want to:	Read:
Understand the difference between the database users the dbadmin user creates on the server versus MC users who access HP Vertica through a browser.	About MC Users and About MC Privileges and Roles in the *HP Vertica Administrator's Guide*
Understand how to create projections using Database Designer	Physical Schema in the *HP Vertica Administrator's Guide*

Performing advanced database administrator tasks

This section describes additional tasks that HP Vertica database administrators can perform. For more information, see the *HP Vertica Administrator's Guide*.

Installing HP Vertica software for third-party tool integration

Third-party products let you access your HP Vertica database using one of our supported client drivers. You can use many third-party tools with HP Vertica. For a list of HP Vertica partners and the tools they provide, see http://www.vertica.com/partners/.

While you can configure many third-party tools to work with HP Vertica through standard client connections, HP provides additional software to help with integration of the following products:

- Informatica — To use HP with the plug-in for the Informatica PowerCenter, see *HP Vertica Plug-in for Informatica Guide*.
- Microsoft — To integrate your HP Vertica server with an environment that includes Microsoft components previously installed on your system (for example, Microsoft Visual Studio and Microsoft SQL Server), see the *HP Vertica Connectivity Pack Guide*.

NOTE: Each third-party tool may use different drivers for connecting to HP Vertica. For details and requirements, refer to the vendor documentation for the tool you want to use.

See "Learn about third-party integration" (page 20) to learn more:

Table 6 Learn about third-party integration

If you want to:	Read:
Read about the supported client drivers that you can download from HP Vertica, including information about driver managers, client/server compatibility, and client-specific requirements.	HP Vertica Client Drivers in the HP Vertica documentation.
Learn about the optional modules that HP provides for HP Vertica clients.	Packs, Plug-ins, and Connectors for HP Vertica Clients in the HP Vertica documentation.

Managing load balancing for client connections

Each client connection to an HP Vertica host in the cluster requires a small overhead in memory and processor time. Many client connections to a single host can affect database performance. When you use connection load balancing, HP Vertica automatically spreads the overhead of client connections across the cluster by having hosts redirect connections to other hosts. For details, see Connection Load Balancing in the *HP Vertica Administrator's Guide*.

Managing database resources

To maximize performance, HP Vertica uses the maximum available CPU and memory resources. The HP CS300 Vertica is optimized to run the database on dedicated servers for large data sets of complex workloads.

Changing the `dbadmin` password

For security, factory-default passwords were changed during the HP CS300 Vertica Installation & Startup Service. The HP CS300 Vertica appliance was configured using a password your organization supplied for the non-root, system account, dbadmin. You should not need to change the password.

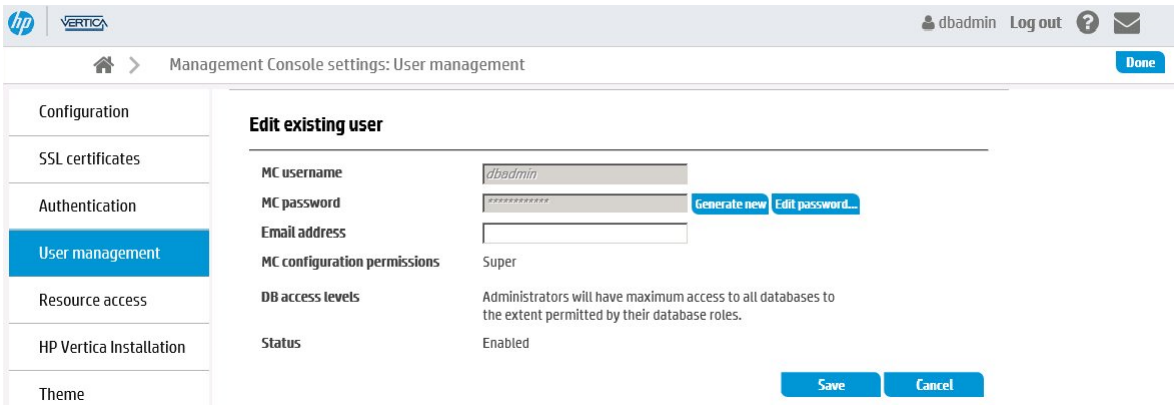
If you change the HP Vertica administrator password, you must use the same username and password on all HP Vertica nodes and management servers.

To maintain password consistency across all devices in the appliance, HP recommends:

- Change the dbadmin password from the HP Vertica management server.
- Manually change passwords on the switches, PDUs, management servers (r001mn001 and r001mn002), and HP iLOs.

TIP: You must also change the Management Console administrator's password.

To change this password on the Management Console, click **MC Settings→Configuration→User management**.



IMPORTANT: The HP Vertica Management Console only changes HP Vertica passwords. Linux and other device passwords must be changed separately

Installing or upgrading an HP Vertica license key

As part of the HP CS300 Vertica Installation & Startup Service, your HP Vertica license was installed and an employee in your organization accepted the EULA. Your license is stored on the r001mn001 server in the `/opt/hp/CS300/licenses/<cust_vlicense_xxx_bytes.dat>` file.

For details about HP Vertica licensing, see Understanding HP Vertica Licenses in the *HP Vertica Administrator's Guide*.

More information for using HP Vertica

The full HP Vertica documentation set, summarized in "HP Vertica documentation" (page 22), is available online at:

http://www.hp.com/go/convergedsystem/cs300vertica/docs

Table 7 HP Vertica documentation

If you want to:	Read:
View supported operating and file systems, client drivers, and packs, plug-ins, and connectors for the HP Vertica server and client systems	*HP Vertica 7.x.x Supported Platforms*
Learn about new features, performance improvements, and behavior changes in the current release	*HP Vertica 7.x.x New Features*
Work through the entire HP Vertica Getting Started Tutorial	*HP Vertica Getting Started Guide*
Gain a quick understanding of the HP Vertica approach and its primary components	*HP Vertica Concepts Guide*
Learn how to set up and maintain an HP Vertica Analytics Platform database, including: • Implement security and manage users, roles, and privileges. • Create tables and load data into them. • Run the Database Designer (create projections). • Back up, restore, and recover the database. • Monitor and profile database performance.	http://www.hp.com/go/convergedsystem/cs300vertica/docs
Learn about a different kind of table that's designed especially for loading and querying unstructured data	*HP Vertica Flex Tables Guide*
Look up SQL syntax, arguments, and examples for data types, functions, statement, and system tables	*HP Vertica SQL Reference Manual*
Learn how to perform various programming tasks, such as: • Install supported drivers and connect to an HP Vertica database using client drivers. • Optimize complex SQL queries. • Develop user-defined functions.	*HP Vertica Programmer's Guide*
Learn about how to integrate Apache Hadoop and its components (HCatalog and HDFS) with the HP Vertica server	*HP Vertica Hadoop Integration Guide*
Read about the optional modules HP provides for the HP Vertica server	*Packs, Plug-ins, and Connectors for HP Vertica Server*
Look up Java classes, structs, unions, and interfaces	*HP Vertica Java SDK API*
Look up C++ classes, structs, unions, and interfaces	*HP Vertica C++ SDK API*
Look up JDBC packages and classes	*HP Vertica JDBC API*
Look up common database terms and those specific to HP Vertica	*HP Vertica Glossary*

4 Support and other resources

Information to collect before contacting HP

Be sure to have the following information available before you contact HP:

- Software product name
- Hardware product model number
- Operating system type and version
- Applicable error message
- Third-party hardware or software
- Technical support registration number (if applicable)

How to contact HP

Use the following methods to contact HP:

- In the United States, see the Customer Service / Contact HP United States website for contact options: http://welcome.hp.com/country/us/en/contact_us.html
- In the United States, call 1-800-HP-INVENT (1-800-474-6836) to contact HP by telephone. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, conversations might be recorded or monitored.
- In other locations, see the Contact HP Worldwide website for contact options:
  http://www.hp.com/go/assistance

Typographic conventions

The following conventions are used in this document:

Table 8 Typographic conventions

Example	Uses
`Command`	A command name or command phrase, for example `ls -a`.
`Computer output`	Information displayed by the computer.
`User input`	Indicates commands and text that you type exactly as shown.
`Replaceable`	The name of a placeholder that you replace with an actual value.
Note	An alert that contains additional or supplementary information.
Tip	Provides helpful hints or an alternative method for completing a task.
WARNING	An alert that calls attention to important information that if not understood or followed can result in personal injury.
CAUTION	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.

5 Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hp.com). Include the document title and part number, version number, or the URL when submitting your feedback.